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Kidney Trays— Specification

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In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

DRAFT KENYAN STANDARD

Kidney Trays— Specification

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Foreword

This draft Kenya Standard has been prepared by the Technical Committee on Hospital Devices, Tools and Equipment under the direction of Standards Project Committee (SPC), and it is in accordance with the procedures of the Bureau.

A kidney dish (British English) or emesis basin (American English) is a shallow basin with a kidney-shaped base and sloping walls used in medical and surgical wards to receive soiled dressings and other medical waste. Reusable kidney dishes are usually made of stainless steel, while disposable ones may be made of paper pulp or plastic. The shape of the dish allows it to be held against the patient's body to catch any falling fluids or debris. Various sizes of emesis basin are a common sight in healthcare settings, including facilities such as nursing homes that may have bedridden patients. The disposable version of the kidney dish was invented by Bessie Virginia Blount.

The disposable molded pulp kidney dish is replacing reusable kidney dish because single-use products can decrease cross-communication of diseases.

Generally, the volume of a pulp kidney dish (or "vomit dish") is 700 ml. Its length is 25 cm-26 cm, its width 11 cm. Each year more than 100 million pulp kidney dishes are used in hospital or family care.

Contrary to its name, emesis basins are not usually used for vomiting, as the depth, size, and sloping walls all contribute to spilling or splashing the vomit rather than catching it. For this purpose, a plastic bag or wash basin is often preferred, especially by ambulance crews who may need to receive the vomit while driving rapidly, and then hand it over for analysis.

Emesis basins are suited for more controlled situations. When washing out a small wound, for example, sometimes the wash water is applied from above with an emesis basin held underneath to catch the runoff. The concave inner rim helps to conform to the curve of the body.

During the development of this standard, reference was made to the following documents:

IS 3992 : 1982, Trays, Kidney

Acknowledgement is hereby made for the assistance received from these sources.

DRAFT KENYAN STANDARD

A Standard for Standards—

Part 1: Kidney Trays — Specification

1 Scope

This Kenya Standard prescribes requirements of stainless steel and enameled iron kidney trays.

2 Normative references

The following Standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. For undated references, the latest edition of the normative document referred to applies.

ISO 19496-1:2017, Vitreous porcelain enamels – Terminology, Part 1: Terms and definitions

ISO 19496-2:2017, Vitreous porcelain enamels – Terminology, Part 2: Visual representation and determination

Kenya Bureau of Standards, Quality Manual

World Trade Organization, Technical Barriers to Trade (WTO/TBT) Agreement Annex 3: Code of Good Practice for the preparation, adoption and application of standards

3 Terminology

For the purpose of this standard, the definitions given in KS ISO 19496 Parts 1 and 2. Glossary of terms used in vitreous enamelware industry' shall apply,

3.1
Material
This shall be **Stainless Steel-** Stainless steel shall conform to Designation XC4Cr18Ni11 or X07Cr18Ni9.

3.2
Enameled Iron
The base metal shall conform to Annex A and the coating shall comprise inorganic vitreous enamel fused to the surface of the base metal.

4 4. Shape and Dimensions

4.1 *Shape* - The shape of kidney trays shall generally conform to Fig, 1. The contour shall be such that the trays of the same size when nested together shall not become jammed. The contour of sides shall bulge outside as shown in Fig, 1. The base shall be flat.

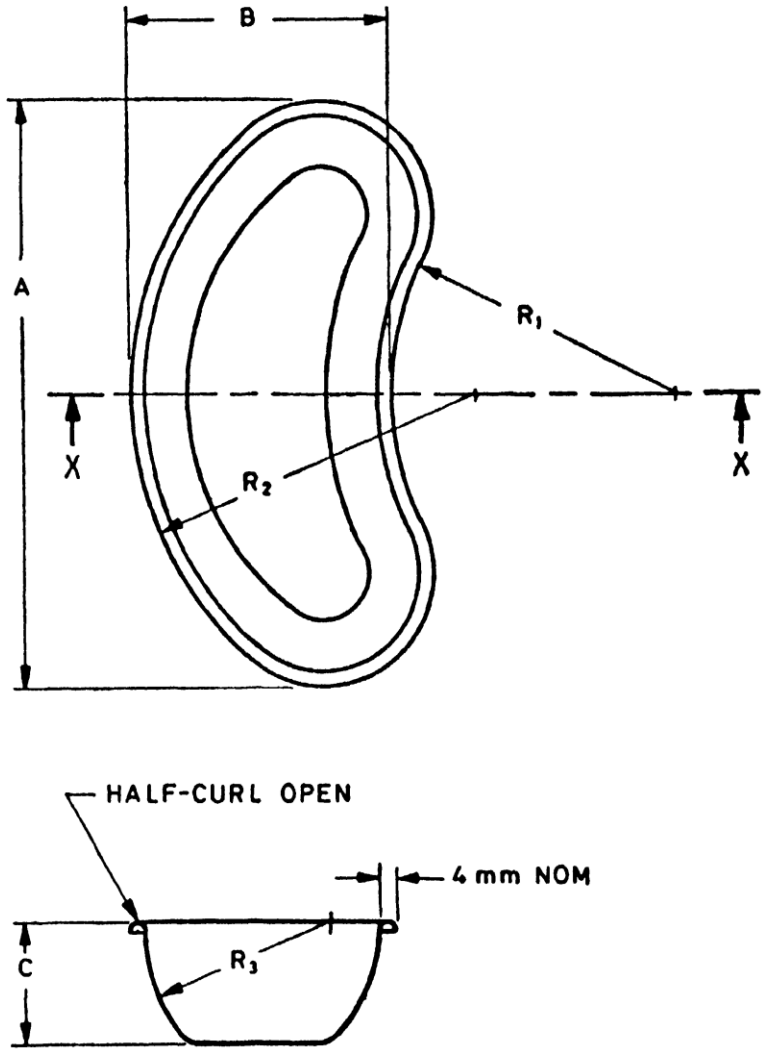

FIG. 1 KIDNEY TRAY (STAINLESS STEEL AND ENAMELLED IRON)

4.1.1 The kidney trays shall have the rim as shown in Fig. 1.

4.2 Dimensions - The dimensions of kidney trays shall be as given in Table 1 read with Fig. 1 for all the trays (stainless steel and enameled iron) subject to the following tolerances:

Dimensions mm	*Tolerance* mm
Up to 50	± 1
51 to 100	± 2
101 to 200	± 3
201 and above	± 5

TABLE 1 DIMENSIONS OF KIDNEY TRAYS

All dimensions in millimetres.

Length	Width	Height	Radius of Curvature			Minimum Thickness of Material	
						Stainless Steel	Enamelled Iron (Base Metal)
A	*B*	*C*	R_1	R_2	R_3		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
150	70	30	75	90	45		
200	90	40	100	120	60		
250	100	50	125	150	75	0·45	0·5
*250	150	40	170	150	125		
300	130	60	150	180	90		

*Shallow type kidney tray.

4.2.1 The enameled iron trays may have two or three coats of enamel and the final thickness of enamel shall be between 0.12 and 0.38 mm.

4.3 A deviation of maximum 15 percent shall be permitted for negative tolerance on sheet thickness and the reduction in the drawing due to forming process.

5. Workmanship and Finish

5.0 In general, the kidney trays shall be so constructed that these shall not rock when placed on a level surface.

5.1 *Stainless Steel Trays*- The trays shall be polished bright. These shall also be free from sharp or open edges, distortion, dents, wrinkles, wavy surface, burrs, scratches and pittings.

5.2 *Enameled Iron Trays* - Vitreous enamel shall be applied in such a way that ground and cover coats shall be fairly uniform in thickness. Unless otherwise specified, the enamel shall have white color with blue rim. The finished enamelware shall have a glossy finish and shall be free from blisters, crazing, cracks, chipping, pin-holes, discoloration, and other imperfections which affect the appearance or may impair the serviceability.

6. Tests

6.1 *Enameled Iron Trays*- These shall satisfy the test requirements covered in Annex B.

6.1.1 *Citric acid spot test* - When subjected to test in accordance with Annex A - Methods of test for vitreous enamelware'. it shall pass the requirements for Class AA.

7. Marking - Each kidney tray shall be suitably marked at the bottom with the manufacturer's name, registered trade-mark or identification mark and its size.

7.1 *Certification Marking* - Details available with the Kenya Bureau of Standards.

8. Packing - The kidney trays shall be wrapped in soft tissue paper and packed in accordance with the instructions of the purchasers.

Annex A
(Normative)
Methods of test for vitreous enamelware
Preparation of specimen for testing - enamelled cast iron

A1. SCOPE
This Annex specifies methods for the production of specimens suitable for testing vitreous enamels for cast iron and enamelled cast iron articles.

A2. TERMINOLOGY

A2.1 For the purpose of this standard the definitions given in KS ISO 19496 Parts 1, 2 and KS ISO 28764 shall apply.

A3 SHAPE AND DIMENSIONS OF SPECIMENS
A3.1 The specimens shall be flat, circular, square or rectangular enamelled plates of cast iron with a diameter or side length of any suitable size not exceeding 110 mm.

NOTE — Shape and dimensions depend upon the dimensions of the testing apparatus and the kind of balance, if loss in mass is to be determined; the required weighing accuracy being 0.2 mg.
3.2 The specimens may be specially cast plates or plates cut from a cast iron bar, with a minimum thickness of 2.5 mm, or they may be cut from enamelled cast iron articles.

NOTE — If the mass of the cast specimens exceeds the carrying rapacity of the balance, it is permissible to reduce the thickness by machining. For a balance with a carrying capacity of 200 g, specimens of the following dimensions are suitable:
a) specially cast plates of cast iron with a diameter of 95 mm and a thickness of 30 ± 0.2 mm; or

b) plates with a diameter of 105 mm and thickness of 2.5 mm cut from a cast iron bar or cut from enamelled articles.

A4. PRODUCTION OF SPECIALLY PREPARED SPECIMENS

A4.1 Material
The cast iron upon which enamel is applied shall be enamelling quality cast iron.

A4.1.1 The approximate composition of minor constituents of cast iron shall be according to cast iron meeting the following specification: Carbon: 2.3 –2.7 wt%, Si: 1.0 –1.75 %.

A4.2 Procedure
A4.2.1 **Dry Process Enamels** — Anneal the cast plates at a temperature between 750 to 800°C. Prepare the plates for enamelling by any one of the recognized procedures, but use the same procedure and materials for preparing specimens for comparison.

A4.2.1.1 Apply ground coat by pouring or spraying one or both sides of the specimen so that agreed thickness of coating is obtained.

A4.2.1.2 After drying and fusing of the specimen, apply the cover coat on one side only and fuse again, ensuring that there is a minimum of build-up around the edge of the specimen.

NOTE — For most purposes two cover coats are standard procedure, but in cases where more cover coats are considered to be usual practice, the additional coats shall be applied.

A4.2.1.3 Coating thickness may vary but specimens for comparison shall be of the same thickness.

A4.2.2 Wet Process Enamels — Anneal and prepare the cast plates as specified in 4.2.1.

A4.2.2.1 Apply ground coat as in 4.2.1.1.

A4.2.2.2 After drying, fusing and cooling of the specimen, apply the cover coat on one side only. For ensuring that there is minimum of build-up around the edge of the specimen, suitably wipe the applied enamel from the edges to a width of 2 mm after drying and then fuse.

NOTE — For most purposes one cover coat is standard procedure, but in cases where two or three cover coats are considered to be usual practice, the additional coats shall be applied.

A4.2.2.3 Coating thickness may vary but specimens for comparison shall be of the same thickness.

A4.2.3 Direct-on Enamels for Cast Iron — Anneal and prepare the cast plates as in 4.2.1.

A4.2.3.1 Apply the enamel to one or both sides of the specimen according to accepted practice.

NOTE — When in practice the usual application consists of one coat only, one coat shall be applied. In cases where additional coatings are a necessary part of the finish, these coatings shall be applied accordingly.

A4.2.3.2 Coating thickness may vary but comparative specimens shall be of the same thickness.

A4.3 Quality of Surface and Finish
The surface of the enameled specimens shall be flat and free from defects.

A4.3.1 The specimens shall be checked by visual inspection for freedom from defects. However, the specimens for enamels for containers and apparatus for the chemical industry shall be checked with high voltage for freedom from weak places and pin holes in accordance with KS ISO 8289.

A5. SPECIMENS FROM PRODUCTION ARTICLES

A5.0 General — Specimens shall be taken only from flat areas of the enamelled articles.

A5.1 Procedure — Before cutting off the specimens, remove the enamel along the cutting surface by grinding, the width of the zone from which the enamel is to be removed being determined by the width of the cutting tool and an extra margin of 2 mm for safety. If the loss in mass per unit area of the enamel coating is to be determined, specimens shall be taken from those flat areas where the reverse side is protected by at least a ground or direct-on enamel coat as the case may be.

NOTE — Grinding machines are suitable for grinding off the enamel, where silicon carbide, corundum or diamond grinding wheels are used.

Annex B
(Normative)
Tests

A1 TES T SPECIMEN
The test specimen shall be prepared in accordance with Annex A.

B2 REQUIREMENTS
B2.1 Materials
B.2.1 **Base Metal**
The base metal and the component used for the fabrication of enamelled inner tank shall be made of steel sheet. The nominal thickness of the steel sheet used shall be 2 mm and the same shall not vary by more than 8 percent on the high side and 16 percent on the lower side of the nominal value when determined in accordance with the method prescribed below.

B2.1.1 Remove the enamel layer of the sample by immersing it, at least up to a depth of 1 cm, in molten caustic soda (sodium hydroxide) at 530° to 550°C in a stainless steel or nickel dish, for a period of 15 to 30 minutes, depending on the thickness of the enamel layer. After the enamel layer has been dissolved from a minimum area of 0.5 cm width and 3 cm length along the edge, wash the sample with water sufficiently to remove the last adhering oxide layer below the enamel. Wipe the exposed metal with clean cloth and quickly dry in an air-oven to avoid resting.

B2.1.2 Measure the thickness of the exposed metal by means of a micrometer at three points, each point at a distance of at least 1 cm from the preceding one. The average of the three measurements shall be taken as the thickness of the metal.

NOTES 1 For the purpose of this test, it is presumed that the thickness of the whole ware is the same. 2 In case an enamelware comprises two or more components of different thicknesses welded together, each such component shall be treated as a separate enamelware.

B3 Enamel
B3.1 All surfaces of the tank that are exposed to hot water shall have a continuous coating of vitreous enamel. The outside of the tank shall also be projected with a thin enamel coat.

B3.2 The composition of the enamel shall be such as to meet the requirements given in B.3.2.1 to B3.2.5.
B3.2.1 Release of toxic material The enamel shall pass the permissible release limits of 0.5 mg/dm2 for lead (as Pb) and 0.05 mg/dm2 for cadmium (as Cd) when tested by the methods given in Annex C.

B3.2.2 Resistance to citric acid The enamel shall pass the resistance to citric acid test at room temperature for 'AA' or 'A' class when tested by the method prescribed in Annex D.

B3.2.3 Solubility test The enamel when tested by the procedure given in Annex A shall not suffer a weight loss of more than 4 mg/cm2. 5.3.2.4 Resistance to thermal shock The enamel shall pass the resistance to thermal shock test when tested by the procedure given in Annex B.

B3.2.5 Impact resistance test The enamel coating shall not show any instantaneous chipping at the impact point when subjected to an impact force of 3.4 kg/cm2. This impact force is achieved by making a steel ball weighing 43 ± 1 g to fall freely from a height of 80 cm at a plain segment of the inner part of the tank having a flat area larger than the cross sectional area of the ball.

NOTE — For the purpose of this testing, chipping shall be considered as those fractures of enamel coating, which result in spontaneous removal/breaking away of the damaged enamelled flake. Any

delayed chipping or chipping on the opposite side of the impact face shall not be taken into account for evaluating the test result of the sample.

B3.3 Thickness
The thickness of the enamel coating shall be between 0.2 mm to 0.4 mm.

B3.4 Coverage
In order to be considered a continuous coating, the enamel shall have the minimum defects or discontinuities.

NOTE — Any break in the coating that is sufficient to expose the surface of the steel base shall be a cause of rejection (see 5.6).

B3.4.1 Cathodic protection If there is any discontinuity in the enamel coating more than the maximum limit prescribed in 5.6 then cathodic protection shall be provided. Each enamelled tank shall be furnished with a cored magnesium anode having a surface density of magnesium not less than 275 g/m2 of the inner tank area. The anode shall be electrically grounded to the tank.

B3.4.2 Exceptions to cathodic protection.
For use in areas where experience has shown that cathodic protection shall not be used, the enamelled tanks may be furnished without anodes, if (a) the tanks are so labelled, and (b) the enamel is applied in such a way so as to ensure the complete coverage of the steel.

B3.5 Edges and Fittings
All edges and fittings, welded or otherwise, shall be coated with enamel except sharp edges, threadings and small areas immediately adjacent to various fittings. A slight burn-off of enamel, that does not extend more than 6.25 mm back from the sharp edges, shall be permitted.

B4 Storage Capacity
The storage capacity of each tank shall be within ± 5 percent of the rated capacity marked on the tank.

B4.1 The tray shall be fixed in its working position. The drain plug and all outlets except the top most outlet shall be plugged. The container is filled with water through its inlet until water starts flowing at the top most outlet. The inlet is closed and when the overflow ceases completely, the water is drained out through the drain plug and the volume of water determined either by measuring or weighing. The capacity so measured is called the storage capacity.

B5 Hydrostatic Test
B5.1 The enamelled tray shall withstand the water pressure occurring in normal use.

B5.2 The inner containers are subjected to water pressure which is raised to a specific value (see B5.3) at a rate of 0.13 Mpa/s1) and is maintained at that value for 5 minutes.

B5.3 The water pressure is twice the rated pressure for containers of closed water heaters.

B5.4 After the test, the container shall show no leakage nor any permanent deformation.

B6 Enamel Coverage Test
After completing the hydrostatic test (see 5.5), the tanks shall be cut into four or more segments using a saw. Each segment shall be visually inspected for the presence of exposed metal areas except the cracked areas of the enamel caused by the cutting operation. If any exposed area of the metal shows a diameter of more than 3.5 mm, the tank shall be regarded as failing to meet the requirement of the test.

B6.1 If a large number of exposed metal areas of smaller diameter are observed, the average diameter of such exposed metal areas shall be computed and from that the total exposed metal area shall be calculated. If this area exceeds 7 cm2/m2 of the inner tank surface, the sample shall be regarded as failing to meet the requirement of the test.

ANNEX C
(Normative)
DETERMINATION OF RESISTANCE TO THERMAL SHOCK

C1 Outline of the Method
The test for thermal shock resistance consists of heating the specimen to 140 ± 3°C and then chilling with water at room temperature.

C2 Apparatus
Hot air oven capable of maintaining temperature of at least 150°C.

C3 Procedure
Heat the specimen in the oven to 140°C ± 3°C at the rate of 5°C–10°C per minute. As the required test temperature is attained, maintain the sample at this temperature for 30 minutes Switch off the oven and remove the sample and quench it in water at room temperature. At least two samples shall be tested. Examine the samples for any cracking, flaking or blistering. The samples which show occurrence of any chipping of the enamel shall be considered as not being in conformity with the standard.